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Interaction of human serum albumin with linolenic acid: stability and structural analysis

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ABSTRACT

The interaction between Human Serum Albumin (HSA) and linolenic acid (LA) as unsaturated fatty acid have been investigated by the methods of UV–VIS spectrophotometer, fluorescence, circular dichroism (CD) spectroscopy and ELISA test. The thermodynamic parameters were assessed from thermal and chemical denaturation of the HSA with and without presence of LA. In thermal denaturation the magnitudes of T_m and $\Delta G^0_{(298K)}$ were obtained 327.7 K and 88 kJ/mol for sole HSA and 313.23 K and 86 kJ/mol for its treatment by 10 µM LA. The same manner of reduction in Gibbs free energy as the criterion of protein stability was achieved in chemical denaturation by urea in the presence of LA. The interaction of LA with HSA was emphasized after its competition with L-thyroxin through ELISA assay. Although the regular secondary structure of HSA by CD showed a minor change after incubation with LA, its tertiary structure revealed an observable fluctuation. Thus, it seems, that the interaction of LA with HSA needs a minor instability and partially change of its structure.

Key words: Human serum albumin; Linolenic acid; Structure; Thermodynamic; L-Thyroxin